Does the Application of Investment Properties’ Measurement Models Affect the Profitability of the Company? – The Case of Insurance Companies in Croatia

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Abstract

The aim of this research is to determine to what extent a particular model of measurement of investment in properties is applied in insurance companies in Croatia, and to investigate whether the application of a particular model affects the profitability of insurance companies. The research refers to the period from 2017 to 2021, and is conducted on 11 insurance companies that have recognized investments in real estate in their financial reports. In order to implement the research objectives, descriptive statistical methods were applied. The research results showed that 6 out of 11 insurance companies apply the cost model, while 5 insurance companies apply the fair value model. Insurance companies that apply the fair value model hold 56.17% of the total assets of all insurance companies in Croatia. Furthermore, the research results showed that insurance companies that applied the fair value model achieved higher profitability (measured by the ratio of return on assets) compared to the profitability of the entire insurance sector and the profitability of those insurance companies that applied the cost model. Finally, the research results indicated that the application of the fair value model in measuring investment properties has a greater effect on the profitability of insurance companies in Croatia than the application of the cost model.

Keywords: cost model; fair value model; insurance companies; investment properties; return on assets

1. Introduction
Companies that compile their financial statements in accordance with International Financial Reporting Standards (hereafter: IFRS) apply International Accounting Standard 40 – Investment property (hereafter: IAS 40) for investments in properties. By applying IAS 40, companies have the right to choose between the two models of subsequent measurement of investment properties, that are the cost model and the fair value model. Depending on the significance of investment properties in the company's assets, the application of a certain model can have a significant effects on the profitability of the company, given that the impact of subsequent measurement of investment properties using a particular model is different. In this paper, the emphasis is on insurance companies that, among other, invest in properties.

At the end of 2022, a total of 15 insurance companies based in the Republic of Croatia operated on the insurance market. Out of the total number of insurance companies, 3 of them performed exclusively life insurance business, 4 of them exclusively performed non-life insurance business, while the remaining of 8 insurance companies performed life and non-life insurance business (Croatian Insurance Bureau, 2023). Insurance companies are generally conservative investors who have a long investment horizon. In the Republic of Croatia, the largest part of investments are investments in debt financial instruments (64.30% was the share of total investments at the end of 2022). A significant part of the investment are investments in real estate with 10.3% (Croatian Insurance Bureau, 2023). Considering a significant part of investment in real estate, this paper will investigate whether the chosen model of measurement of investment in real estate affects the profitability of insurance companies. In this paper, the research refers to the period from 2017 to 2021, and is conducted on 11 out of 15 insurance companies that have recognized investments in real estate in their financial statements. In order to implement the research objectives, descriptive statistical methods were applied.

In this paper, after the introduction part where it is explained why the research is carried out on insurance companies, a literature review is given in which the accounting treatment of investments in real estate is explained in accordance with IAS 40, such as how the application of a particular model affects the financial statements. Also, there is an overview of previous research on the application of a particular model, which model is more relevant to investors and the connection of the model with the profitability of the company and share prices. After that, the methodology is described, the research questions and research hypotheses were stated, such as the discussion on the results of the study. The paper ends with a conclusion that summarizes the concluding considerations of the entire paper.
2. Literature review

2.1. Accounting treatment of investment properties under IAS40

In this paper, the research focus is on insurance companies. In the Republic of Croatia, according to the Accounting Act, subjects of public interest, which includes insurance companies, are obliged to compile and publish financial statements in accordance with International financial reporting standards (Accounting Act, 17.3.). In accordance with the above, the following will present the accounting treatment of investments in real estate in accordance with International Financial Reporting Standards.

The accounting treatment of investment property is disclosed in International Accounting Standard 40 – Investment property (hereafter: IAS 40). Investment property is property that is held in order to earn rentals, for capital appreciation, or both. It doesn’t refer to property which is held for use in the production, supply of goods, for administration or held for sale in the ordinary course of business (IAS 40, 5). Investment property is initially measured at its cost, with the transaction costs included in initial measurement (IAS 40, 20). When it comes to measurement after recognition, company can choose between the cost model and fair value model. Considering that the application of those two models can have a different impact on the amount of assets, as well as on the amount of income and expenses, the selection of the subsequent measurement model can have a significant impact on the financial statements. Below is a brief overview of those two models and their impact on financial statements:

<table>
<thead>
<tr>
<th>Model of subsequent measurement</th>
<th>The value at which the asset will be reported on the measurement date</th>
<th>Calculation of depreciation</th>
<th>Impact on the amount of assets in the balance sheet</th>
<th>Impact on the financial result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost model</td>
<td>Cost less accumulated depreciation and impairment losses</td>
<td>Yes</td>
<td>Decreases over time</td>
<td>Increase expenses</td>
</tr>
<tr>
<td>Fair value model</td>
<td>Fair value</td>
<td>No</td>
<td>It can be decreased or increased</td>
<td>Increase expenses and income</td>
</tr>
</tbody>
</table>

Source: Authors according to IFRS

According to Table 1, if company applies the fair value model, there should be a more significant impact on the profitability of the insurance companies, given that increases in fair value also have a positive impact on the company's financial result, considering that they increase the company's income, and there are no costs from the depreciation. On the other hand, the application of the cost model affects only the presentation of expenses that have a negative impact on the company's financial result. The application of the fair value model is
more complex than the application of the cost model, which can also affect the decision-
making on the selection of the model for the subsequent measurement of investment in real
estate.

2.2. Previous research on investment properties measurement models and its effects

There are many studies related to the models of subsequent measurement according to IAS
40, which models are applied, how investors and auditors perceive them, what is their
relation with the profitability of companies and stock prices, and which one is more
relevant. An overview of the research on this topic will be given below.

There are numerous studies on which model of subsequent measurement is applied, and
the results are different, somewhere the cost model is applied to a greater extent and
somewhere the fair value model is used in a larger percentage. Therefore, it is difficult to
draw a conclusion which model is generally more applicable. Research among Russian banks
which compile their financial statements by international standards, showed that most of the
companies applied valuation of investment property at fair value (Kulikova, Samitova and
Aletkin, 2015). Based on research from Bucharest Stock Exchange, “40% of listed
companies are investment funds and properties”; such as that “more than 50% of Romanian
companies are using historical cost.” Results also indicate that Romanian companies use
historical cost if they are unlisted at international stock market, are small and unlisted at stock
market, have less variability in revenues reported or with less leverage (Cristea, 2016). Based
on the research among companies listed on the BM&FBOVESPA, “out of the 39 selected
companies, 44% adopted fair value method and the remaining 56% opted for the cost
method” (Andrade, da Silva and Malanquais, 2013). Regression results on research in India
shown that “profitable companies and companies in real estate industries are more likely to
apply cost model for investment property, while companies with high percentage of
institutional investors and higher growth are less likely to use the cost model” (Wahyuni et al,
2019). In a study by Lourenco and Curto (2008) among listed real estate companies in four
European countries there was a higher number of observations for recognized amounts of
investment property accounted for under the fair value model compared to the cost model. In
Latvia (Bumane and Kasale, 2012), the choice of accounting policy regarding investment
properties is limited by the provisions of national taxational legislation. Therefore, cost
method is chosen in accounting practice, while the evaluation and accounting of investment
properties using fair values are partially ignored. „The evaluation of investment properties
according to the fair value is considerably limited by the provisions of national taxation
legislation and the present situation in the real estate market of Latvia, where the level of
activities is low.” Ciartano (2012) analysed how Real Estate Investment Trusts (REIT) listed
on London Stock Exchange value their investment properties under construction. Results
showed that all of the REITs in the final sample (that have investment property under
construction) adopted the fair value option that is available in the amended IAS 40 when measuring their investment property under construction.

There are numerous reasons why individual companies decide to use one model over another. Various studies show that there are various factors that can influence the choice of a particular model. Based on a sample of EU investment properties companies, (Fearnley and Gray, 2014) conducted a research to investigate weather accounting choices under IFRS are influenced by national institutional factors. Results indicated that national institutional factors, such as cultural values are persistently important in explaining accounting measurement choices regarding investment properties under IAS 40, relative to legal and equity markets development factors. Quaglì and Avallone (2010) analysed the choice between cost and fair value model for investment properties on a sample of European real estate companies that are first-time adopters of IFRS. They found that “information asymmetry, contractual efficiency and managerial opportunism could account for fair value choice”. In their case, “size as a proxy of political costs reduces the likelihood of using fair value, while market-to-book ratio is negatively associated with the fair value choice.”

Leverage didn’t have an influence on choice. Guermazi and Damak-Ayadi (2023) analysed determinants that may affect the choices of permanent accounting options during the transition to international financial standards, and their findings are that industry and financial performance are the most used reasons to justify the certain choice. When it comes to IAS 40, the only variable that has a significant direct impact on IAS 40 is relation to the financial industry membership. In the research, “there is a positive link between the choice to opt for fair value and financial industry membership.”

There are also studies that were conducted on the connection of a particular model of subsequent measurement of investment in real estate with the movement of the share price, which also reflects how investors perceive certain values. Research results on Malaysian Real Estate Investment Trusts listed on Bursa Malaysia for research period 2006 to 2011 showed that the information on the fair value of investment property that is presented in balance sheet is significantly related to the share price, while the changes in fair value that is presented as revaluation surplus in income statement is not significantly related to the share price (Mei Zi, Hassan and Embong, 2014). Based on a sample of listed Chinese companies that hold investment properties, Hsu and Wu (2019) analysed weather recognizing fair value of investment property is more associated with stock price crash risk in regard to historical cost. Results showed that “reported fair values of investment properties are more associated with crash risk than reported historical cost”. Lourenco and Curto (2008) investigated whether the recognized cost and fair values, such as disclosed fair value are differently priced by investors. Research was conducted on listed real estate companies in France, Germany, Sweden and United Kingdom. Results indicated that “investors distinguish the recognized cost, recognized fair value and disclosed fair value of investment property, but they don’t distinguish valuation implications of recognized fair value on investment property.”
The application of the fair value model is more complex and thus the auditor's job, which needs to determine the reality and objectivity of financial statements, is more demanding. The main difficulty when measuring investment property is adequate measurement of fair value, which should be done by a professional. Methods of measuring the fair value “should justify the auditors report issues for financial reporting” (Maisuradze and Vardiashvili, 2018). Based on in-depth interviews with auditors, Nordlund, Lorentzon and Lind (2021) analyses the audit of fair values in financial reports. They found out that “auditors anchor in the figure presented by the company, and that despite the auditing efforts, there is a substantial risk of management bias in the reported fair values. That is, there is a risk for confirmation bias.” Sangchan, et al. (2020) conducted a research based on listed companies in Australian real estate industry that apply the fair value model for investment properties in order to investigate the relationship between audit fees, fair value exposure and changes in fair value of investment properties. Their results indicated: negative relationship between audit fees and fair value exposures, positive association between audit fees and changes in fair value, such as that using unobservable inputs in estimating fair value doesn’t significantly increase audit risk and audit fees.

There are also numerous studies on the asymmetry of information which can occur if one model is applied in relation to another. Muller, Reidl and Sellhorn (2011) conducted a research based on a sample of European real estate companies, whose primary operating asset is investment property, in order to investigate relationship between mandatory provision of fair values under IFRS and information asymmetry. Results indicated that information asymmetry differences are reduced with mandatory provision of investment property fair value under IFRS, such as that fair values reported by mandatory adoption companies are less reliable than those reported by voluntary adopted companies. Ghosh, Liand and Petrova (2019) analysed the effect of fair value method adoption on the case of real estate companies in EU. They found out that even though “post IAS 40 asymmetric information decreases and liquidity increases, the disclosure of fair value didn’t lead to lower NAV deviation”. Alhusaini and Elshamy (2016) examined value relevance of unrealised gains and losses reported in income statement under IAS 40 for real estate companies that are listed on Kuwait stock exchange. “The results indicated that unrealised gains and losses that are recognised under IAS 40 have no incremental information content over net income before unrealised gains and losses; such as that the inclusion of unrealised gains and losses in income decreases the explanatory power of the valuation model and decreases the incremental explanatory power of earnings relative to that of book value.” Analysing the sample of publicly traded real estate EU companies that report fair values of their investment properties (Sundgren, Maki and Somoza-Lopez, 2018), results show that analysts and investors perceive favorable if there is provision of high quality disclosures. Also, there is “strong association between
disclosure quality and likelihood that company is followed by analysts”. In this study, disclosure quality is higher under IFRS 13 compared to IAS 40.

Studies was also carried out with the aim of determining how good the estimates based on fair value are, as well as the connection with the company's earnings. Results of a study among U.S. and U.K. investment property companies confirmed that U.K. companies that report under the full fair value model of IFRS have higher EPS (earnings per share) forecast error compared to U.K. companies that are reporting under domestic standards (partial fair value model) or U.S. companies that are reporting under historical cost. It was predicted like that since the unrealized fair value gains and losses on investment properties will be recognized in net income, therefore their EPS forecast errors will be greater (Liang and Riedl, 2014). By analysing the impact of fair value adjustments on dividend policy, Sikadilis and Leventis (2017) conducted a research based on companies listed on Athens Stock Exchange and results implicated that IFRS fair value adjustments on investment properties are persistent, that is, they are reliable when predicting future income. Therefore, companies that revalue investment properties tend to increase dividend payouts. The study by Honkamaki, Matte and Ujala (2021) examined weather there are differences in earning quality under the fair value and cost model in investment property industry. Results indicate that cost model yields better earnings quality in two out of six tests: a) under the cost model, asset values are not undervalued or overvalued, while under the fair value model asset values appeared to be overvalued, and b) cash flows are better predictors of discretionary accruals using the cost model. There were no statistically significant differences in other tests. Elsiefy and ElGammal (2017) analysed the effect of using fair value model under IAS 40 on the fundamental analysis of a one real estate developer company listed on Qatar Exchange. Results show that choice of fair value model has a small impact on balance sheet items, but significant effect on income statement items. It affects all ratios, but didn’t have any impact on share price.

3. Methods

The main purpose of this paper is to determine to what extent a particular model of measurement of investment in properties is applied in insurance companies in Croatia, and to investigate whether the application of a particular model affects the profitability of insurance companies. More specifically, the purpose of this research is to provide answers to the following research questions:

- Do investment properties represent a significant item in the total assets of insurance companies in Croatia?
- Do insurance companies in Croatia apply the fair value model to a greater extent than the cost model?
Does the application of a particular investment properties measurement model affect the profitability of insurance companies?

Based on these research questions, the following research hypotheses were set:

H1: Insurance companies that apply the fair value model achieve higher profitability (measured by the ratio of return on assets) compared to the profitability of the entire insurance sector and the profitability of those insurance companies that applied the cost model.

H2: The application of the fair value model in the measurement of investment properties has a greater effect on the profitability of insurance companies in Croatia than the application of the cost model.

The research population includes all insurance companies that operated in Croatia during the research period from 2017 to 2021. According to data from the Croatian Financial Services Supervisory Agency, there were 20 insurance companies in Croatia in 2017, 18 in 2018, 16 in 2019, and 15 insurance companies in 2020 and 2021. The research was conducted only on those insurance companies that recognized investment properties in their financial statements. A detailed analysis of the financial statements of insurance companies in Croatia found that 11 insurance companies recognized investment properties in their financial statements in all years within the research period.

The data required for the implementation of the research were collected from audited financial statements of insurance companies in Croatia disclosed on their official websites. In order to answer the research questions and test the research hypotheses, descriptive statistical methods were used. The first research question was investigated by calculating the percentage of the carrying amount of investment properties in the total assets of those insurance companies in Croatia that recognized investment properties in their financial statements as well as by using descriptive statistical methods (mean, standard deviation, median, minimum and maximum value). The second research question was examined by analysing the notes to the financial statements of insurance companies in which the application of a particular model for measuring investment properties was disclosed. The third question was investigated by calculating and comparing the return on assets ratio (hereafter: ROA) with investment properties included (in the calculation of return on assets ratio income and expenses from investment properties as well as the carrying amount of investment properties are included) and the return on assets ratio without investment properties included (in the calculation of return on assets ratio income and expenses from investment properties as well as the carrying amount of investment properties are excluded). Furthermore, the first hypothesis was tested by calculating and comparing the ratio of return on assets of those insurance companies that applied the fair value model in the measurement of investment properties with the ratio of return on assets of the entire insurance sector in...
Croatia and the ratio of return on assets of those insurance companies in Croatia that applied the cost model measurements of investment properties. The second hypothesis was tested by calculating and comparing the ratio of return on assets with investment properties included and the ratio of return on assets without investment properties included separately for those insurance companies that applied the fair value model and for those that applied the cost model of measuring investment properties. For the purposes of this research, the return on assets ratio was calculated by dividing net profit by total assets.

4. Results and Discussion

Although insurance companies mainly invest their funds in financial instruments, investment properties are also an interesting investment opportunity for insurance companies. A large number of insurance companies invest their available funds in properties to generate additional rental income or for capital appreciation or both (IAS 40, 2023). In Croatia, based on an analysis of publicly available audited financial statements, 11 out of 15 insurance companies recognized investment properties and related income and expenses in their financial statements. In addition, the share of the carrying amount of investment properties in the total assets of insurance companies in Croatia ranged from 7.13% in 2017, 6.89% in 2018, 6.59% in 2019, 6.90% in 2017, 2020 to 5.67% in 2021. The movement of total assets, investment properties and the percentage of investment properties in total assets of insurance companies in Croatia from 2017 to 2021 is presented in Figure 1.

Figure 1: The carrying amount of investment properties, total assets and the share of investment properties in the total assets of insurance companies in Croatia from 2017 to 2021 (amounts in kn)

Source: Authors’ calculation
According to Figure 1, the share of investment properties in the total assets of insurance companies in Croatia is in a slight decline from 2017 to 2021, with the exception of 2020. However, it is important to emphasize that the share of the carrying amount of investment properties in total assets differs among individual insurance companies in Croatia. In order to get a more complete insight into the share of investment properties in the total assets of insurance companies in Croatia, the mean value, standard deviation, median, minimum and maximum value of the percentage of the carrying amount of investment properties in the total assets in insurance companies in Croatia from 2017 to 2021 were calculated and presented in Table 2.

Table 2: Mean value, standard deviation, median value, minimum and maximum value of the share of the carrying amount of investment properties in the total assets of insurance companies in Croatia from 2017 to 2021.

<table>
<thead>
<tr>
<th>Measure / Year</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>0.098587365</td>
<td>0.096918397</td>
<td>0.093099118</td>
<td>0.092038409</td>
<td>0.066436629</td>
</tr>
<tr>
<td>SD</td>
<td>0.11123817</td>
<td>0.109609729</td>
<td>0.106733375</td>
<td>0.103161582</td>
<td>0.07743615</td>
</tr>
<tr>
<td>Median</td>
<td>0.027439223</td>
<td>0.026501412</td>
<td>0.02363408</td>
<td>0.029134665</td>
<td>0.032773524</td>
</tr>
<tr>
<td>Min</td>
<td>0.001215813</td>
<td>0.001277945</td>
<td>0.001099966</td>
<td>0.000955644</td>
<td>0.000841454</td>
</tr>
<tr>
<td>Max</td>
<td>0.30028483</td>
<td>0.300985841</td>
<td>0.299537116</td>
<td>0.295061497</td>
<td>0.225324102</td>
</tr>
</tbody>
</table>

Source: Authors’ calculation

The mean value ranges from 9.85% in 2017 through 9.6% in 2018, 9.3% in 2019, 9.2% in 2020 to 6.6% in 2021. The standard deviation is in all years greater than the mean value, which indicates a high variability of the data. The mean, minimum and maximum values confirm the large dispersion of the data. These results indicate a large dispersion of the share of the carrying amount of investment properties in total assets among insurance companies in Croatia. The maximum value shows that in some insurance companies the carrying amount of investment properties is a respectable item.

This paper also aims to determine the extent to which a particular investment properties measurement model has been applied among insurance companies in Croatia. According to IAS 40, a business entity can apply either the fair value model or the cost model for subsequent measurement of investment properties, but the chosen model should be applied to all investment properties (IAS 40, p. 30, 2023). Since insurance companies disclose their accounting policy for investment properties measurement in notes, a thorough analysis of the notes provided insight into the application of the investment properties measurement model. The results of the analysis of the notes revealed that 6 out of 11 (or 55%) insurance
companies in Croatia apply the cost model, while 5 out of 11 (or 45%) apply the fair value model (as shown in Figure 2).

Figure 2: Application of investment properties measurement models in insurance companies in Croatia

![Pie chart showing 6.55% for Fair value model and 5.45% for Cost model](chart2.png)

Source: Authors’ calculation

Although the cost model is applied to a somewhat greater extent to measure investment properties among insurance companies in Croatia, the analysis of the notes also showed that insurance companies applying the fair value model hold 56.7% of the total assets of the entire insurance sector in Croatia. Figure 3 shows these results.

Figure 3: The share of the total assets of insurance companies that apply a certain model of measurement of investment properties in the total assets of the insurance sector in Croatia (amounts in kn)

![Bar chart showing 56.17% for Fair value model and 43.83% for Cost model](chart3.png)

Source: Authors’ calculation

The paper further analyses whether the application of a specific model for measuring investment properties affects the profitability of insurance companies in Croatia, measured by the ratio of return on assets (ROA). More specifically, this paper determines whether insurance companies that applied the fair value model in the measurement of investment properties achieve a higher ROA compared to insurance companies that applied the cost model, and whether the application of the fair value model has a greater effect on the ROA of
insurance companies in Croatia than the application cost model. In order to fulfill these objectives and to test the hypotheses of the research, the following were calculated: ROA of the insurance sector in Croatia, ROA of insurance companies that apply the fair value model, ROA of insurance companies that apply the fair value model without investment properties included, ROA of insurance companies that apply the cost model and ROA of insurance companies that apply the cost model without investment properties included. The results of the calculations are presented in Table 3.

**Table 3: ROA of insurance companies in Croatia from 2017 to 2021**

<table>
<thead>
<tr>
<th>Item / Year</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total ROA of the insurance sector</td>
<td>1.489%</td>
<td>1.914%</td>
<td>2.234%</td>
<td>1.337%</td>
<td>1.808%</td>
</tr>
<tr>
<td>ROA of insurance companies that applied the fair value model</td>
<td>1.557%</td>
<td>2.363%</td>
<td>2.854%</td>
<td>1.973%</td>
<td>2.353%</td>
</tr>
<tr>
<td>ROA of insurance companies that applied the fair value model without investment properties included</td>
<td>1.181%</td>
<td>2.108%</td>
<td>2.515%</td>
<td>1.775%</td>
<td>1.727%</td>
</tr>
<tr>
<td>ROA of insurance companies that applied the cost model</td>
<td>1.403%</td>
<td>1.357%</td>
<td>1.482%</td>
<td>0.551%</td>
<td>1.109%</td>
</tr>
<tr>
<td>ROA of insurance companies that applied the cost model without investment properties included</td>
<td>1.360%</td>
<td>1.304%</td>
<td>1.435%</td>
<td>0.515%</td>
<td>1.073%</td>
</tr>
</tbody>
</table>

*Source: Authors’ calculation*

The results shown in table 3 show that the ROA of insurance companies that applied the fair value model is higher than the ROA of insurance companies that applied the cost model and the ROA of the insurance sector in Croatia in all observed years. Also, the ROA of insurance companies that applied the cost model is lower than the ROA of the insurance sector. Based on these results, the first hypothesis of the research, which claims that insurance companies that apply the fair value model achieve higher profitability (measured by the ratio of return on assets) compared to the profitability of the entire insurance sector and the profitability of those insurance companies that applied the cost model, is accepted. In order to assess to which extent investment properties contribute to the achievement of ROA, ROA with investment properties included (meaning that income and expenses from investment properties and the carrying amount of investment properties are included in the calculation of ROA) was compared with ROA without investment properties, separately for insurance companies that applied the fair value model and for insurance companies that applied the cost model. The difference between ROA with and without included investment properties is shown in Table 4.
Table 4: The difference between ROA with and without included investment properties in insurance companies in Croatia from 2017 to 2021

<table>
<thead>
<tr>
<th>Item / Year</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difference in ROA with and without insurance properties included in insurance companies that applied the fair value model</td>
<td>0.376%</td>
<td>0.255%</td>
<td>0.338%</td>
<td>0.198%</td>
<td>0.627%</td>
</tr>
<tr>
<td>Difference in ROA with and without insurance properties included in insurance companies that applied the cost model</td>
<td>0.042%</td>
<td>0.053%</td>
<td>0.048%</td>
<td>0.035%</td>
<td>0.035%</td>
</tr>
</tbody>
</table>

Source: Authors’ calculation

As it can be seen from table 4, the difference between ROA with and without investment properties included is greater for those insurance companies that applied the fair value model compared to those that applied the cost model. Therefore, it can be concluded that the application of both measurement models of investment properties affects ROA, but the application of the fair value model has a greater effect on ROA than the application of the cost model. These results suggest that the second research hypothesis, which claims that the application of the fair value model in the measurement of investment properties has a greater effect on the profitability of insurance companies in Croatia than the application of the cost model, should be accepted.

The research results show that the application of the investment properties measurement model affects the profitability of insurance companies and that the effect is greater for those insurance companies that apply the fair value model. However, this research has certain limitations which must be considered when interpreting the research results. While the research determined that the application of the investment properties measurement model affects profitability, the significance of their effect on profitability was not assessed. Furthermore, the research refers to the period from 2017 to 2021, which includes the period of the COVID-19 pandemic, which significantly affected the measurement of assets and liabilities and the recognition of income and expenses in financial statements. The research did not identify the impact of the COVID-19 pandemic on the profitability of insurance companies. Finally, the research did not analyse life and non-life insurance companies separately.

Despite the limitations, the research results make a certain contribution to the existing results of previous similar research in the field of financial accounting and reporting. Future research on this topic will refer to a longer period and will analyse the impact of the investment properties measurement model on profitability separately for life and non-life insurance. Also, future research will try to identify the impact of the COVID-19 pandemic on the profitability of insurance companies in Croatia.
5. Conclusion

The purpose of this paper is to determine to what extent a particular model of measurement of investment properties is applied in insurance companies in Croatia, and to investigate whether the application of a particular model affects the profitability of insurance companies. The research was conducted on 11 insurance companies in Croatia that recognized investment properties in their financial statements in the research period from 2017 to 2021. The methods used in the research are descriptive statistical methods (mean value, standard deviation, median, minimum and maximum value).

The research results showed that the share of investment properties in the total assets of insurance companies in Croatia is slightly decreasing from 2017 to 2021, with the exception of 2020. Furthermore, the research showed that the cost model is applied to a slightly greater extent than the fair value model, but insurance companies that apply the fair value model hold more than half of the total assets of insurance companies that have recognized investment properties in their financial statements. The results of the research also indicated that the application of the investment properties measurement model affects the profitability of insurance companies, and the effect is greater for those insurance companies that apply the fair value model. In other words, insurance companies that apply the fair value model achieve higher profitability (measured by the ratio of return on assets) compared to the profitability of the entire insurance sector and the profitability of those insurance companies that apply the cost model. In addition, the research results showed that the application of the fair value model in the measurement of investment properties has a greater effect on the profitability of insurance companies in Croatia than the application of the cost model. However, the limitations of the study should be considered when interpreting the results of the study. Despite the limitations, the research results make a certain contribution to existing knowledge from previous research in the field of financial accounting and reporting.
References


